

**A NEW DEEP SEA FISH.—(*Eurypharynx pelecoides*)**

During the last cruise of the *Travailleur* we found off the coast of Morocco, at a depth of 2,300 meters, a fish which may be regarded as one of the most singular beings that deep sea dredgings have ever brought to light. This animal, which is about 0.47 meter in length and 0.02 meter in width at the widest part, is of an intense black color. The body, whose form is hidden in front by the abnormal mouth, recalls that of the *Maerurus*. It tapers off regularly from the anterior quarter, at which point is observed the external branchial orifice, and terminates in a point at the caudal extremity. The anus is located at the junction of the anterior third with the two posterior thirds of the body.

What gives this fish a very peculiar physiognomy is the arrangement of the jaws and the conformation of the mouth, which further exaggerate what Mr. Ayres has described in the *Malacosteus niger*. Although the head is short (scarcely 0.03 meter), the jaws and suspensorium are excessively elongated, the latter measuring no less than 0.095 meter. It results from this that the articular angle is carried very far back, to a distance from the end of the nose equal to about three and a half times the length of the cephalic portion. This suspensorium, as far as can be judged, consists of but two pieces—the one basilar, analogous to the temporal, and the other external, representing without doubt a tympano-jugal. The upper jaw is formed of a long and slender stylet, the situation of which should approximate it to the intermaxillary. The maxillary is wanting, unless we admit that these two bones are confounded.

Upon both jaws small dental granulations may be felt; and at the extremity of the maxillary bone are seen two hooked teeth, 0.002 meter in length. The buccal orifice, as a consequence of such an arrangement, is enormous, and leads to a cavity whose dimensions are still more astonishing. In fact, the upper jaw is united to the sides of the head and of the fore part of the body by an extensible cutaneous fold that permits of considerable stretching; and, between the branches of the maxillary bones, there extends an analogous cutaneous membrane which is much more dilatible, and contains, as shown by a histological examination, a large number of elastic fibers in bundles. It may be well compared with the mouth of the pelican.

As a consequence of the stretching of the jaws and the extensibility of the membranes, the mouth in the living animal forms, along with the pharynx, a vast funnel, of which the fish's body seems to be the tapering continuation. It is presumable that food accumulates in this pouch, and may be partially digested therein, a fact comparable with what has been pointed out in the *Chiasmodus niger*, Johnson.

The locomotive organs are of the most rudimentary nature. The side fins are reduced to two very small appendages whose position near the branchial orifice should make them correspond to the pectorals. The ventrals are wanting. At a distance from the occiput nearly equal to the length of the head begins a dorsal fin which extends nearly the whole length of the back without, however, reaching the end of the tail. The anal fin, which has a similar arrangement, has its origin at a few millimeters behind the anus, and ends at the same point as the dorsal. The extremity of the body is surrounded with a small membranous fold—a sort of rudimentary caudal fin. The delicate and flexible rays of these odd fins are not articulated, or, as far as can be judged from the animal preserved in liquor, united by a membrane.

The respiratory apparatus offers a structure which is as yet unique in bony fishes. We find six pairs of internal branchial clefts, and consequently five branchiæ. These latter are each formed of a double series of free lamellæ. The water makes its exit from each side through a very small orifice that forms a simple rounded cutaneous perforation situated toward the level of the termination of the bucco-pharyngeal infundibulum. Neither a hyoidean apparatus nor opercular pieces are found.

Without entering into a description of the organs contained in the abdominal cavity, it is important to note the complete absence of a swimming bladder.

I propose to designate this fish by the name of *Eurypharynx pelecoides*.

What place should it occupy in the ichthyologic series? This is a point difficult to judge of in the absence of more complete information as to its anatomy, and particularly as to its skeleton, which it is not possible to examine in all its details in a single specimen.

It may be said that the fish offers affinities with the *Acanthini*, with certain *Physostomi*, such as the *Scopelidæ*, the *Stomiidæ*, and with the apodes. Although approaching these latter in the absence of ventral fins and in the imperfect opercular apparatus, it differs too much therefrom in its well-developed and free intermaxillaries to allow it to be placed

in that group. As regards the *Scopelidæ* and *Stomiidæ*, all the known genera of these families have a very widely opened branchial orifice. In the first, the intermaxillary forms alone the free edge of the upper jaw, and in the second the maxillary enters therein for a part. It is to the *Scopelidæ*, then, that the *Eurypharynx* is related, inasmuch as it does not exhibit the hyoidean barbel that has up to the present been indicated as characteristic of the *Stomiidæ*. And of all fishes placed in the *Scopelidæ* by naturalists, it is with the *Malacosteus niger* that we should be tempted to compare the animal under consideration, inasmuch as that fish alone presents us with the simple arrangement of the suspensorium noted above. But it is perhaps with the *Acanthini* that the affinities appear most real, either as respects the form of the body, which recalls that of the *Maerurus*, or as respects the absence of the ventrals, which is habitual in certain animals of this group. So too several *Ophidiidæ* and all the *Lycodidæ*—the latter with their branchial orifice reduced, although not to the point that occurs in our animal—furnish still another probability in favor of this view. However, the characters of the *Eurypharynx* are so decided that it must, in any event, be regarded as the type of a new family of which it will be the only representative, if future studies do not show that it must be joined to the genus *Malacosteus*. —L. Vaillant, in *La Nature*.

**The Latest Improvements in Dyes.**

A. Ehrhardt, of Basel, says the most important discoveries of very recent date in the domain of artificial dyestuffs are those made by Otto Fischer in Munich. The various new methods of preparing rosaniline, the starting point for so many other dyes, may have some importance, as none of the methods hitherto in use can be considered rational, and the yield of fuchsine (hydrochlorate of rosaniline) from either process now in use, either with arsenic acid or with nitrobenzol, never exceeds 33 or 36 per cent of the mass fused, and results in the production of a disproportionately large amount of worthless by-products. Passing over the previous attempts

aniline, toluidine, etc., aniline dyes can be obtained that contain the sulpho group.

Some new blue and violet dyes have been made by Koechlin and Witt, by two different methods. First, the nitro-derivatives of tertiary aromatic amines or phenols are brought in contact with alkaline or ammoniacal solutions of phenols, and reducing agents like zinc dust, protoxide of tin, or grape sugar. Secondly, slightly alkaline, neutral, or slightly acid mixtures of phenols and amines are treated with oxidizing agents, which may be atmospheric oxygen, chromates, ferricyanides, permanganates, hydrochlorites, and the like.

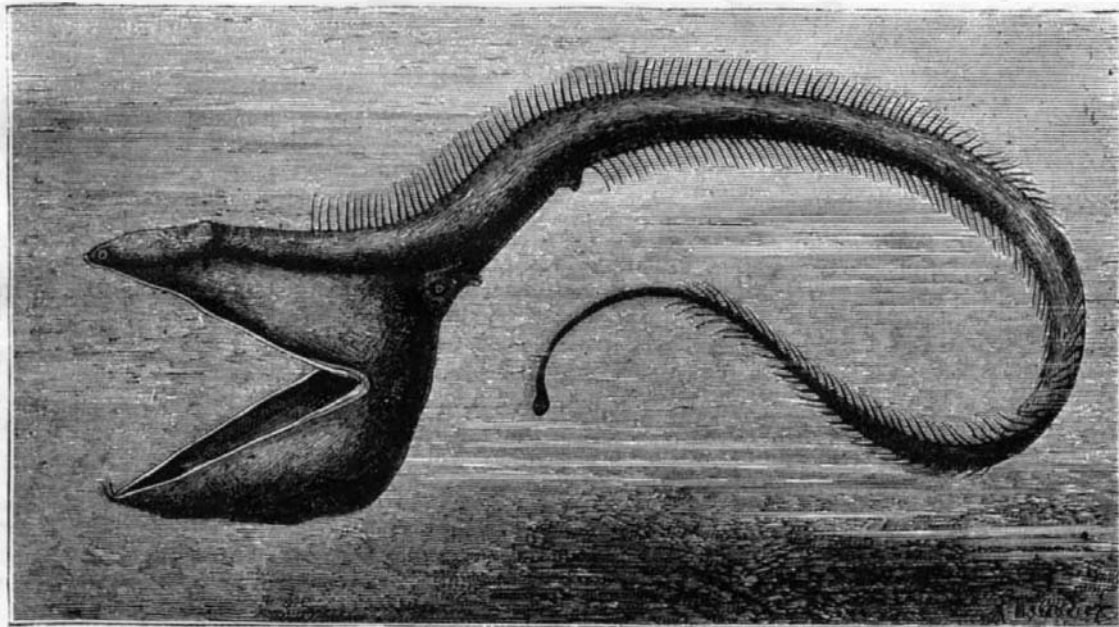
A blue color is also made from amidodimethylaniline and phenol or alpha-naphthol. This dye can also be produced on the fiber, which is of importance in calico printing. The goods are impregnated with a solution of naphthol soda, and when this is dry it is printed with a thickened solution of hydrochlorate of nitrosodimethylaniline mixed with protoxide of tin or grape sugar. Another method consists in printing with a thickened solution of the aniline and naphthol bodies upon cloth saturated with a solution of grape sugar. Or, these two substances are printed on goods not previously prepared, but which is subsequently run through a solution of bichromate. These blues are said to be very permanent in sunlight, so that they can replace indigo with advantage.

**Corn, Beans, and Pumpkins.**

Prof. Asa Gray contributes to *Science* an interesting review of De Candolle's new work, "The Origin of Cultivated Plants," and gives the following concerning the history of our well known trio of staples:

*Phaseolus vulgaris*, our common bean,\* ranks in De Candolle's table as one of the three esculent plants, the home of which, even as to continent, is completely unknown. Linné credited it to India, as he did our Lima bean also; but he took no pains to investigate such questions. This has been so generally followed in the books, that even the "Flora of British India," in 1879, admits the species, adding that it is not anywhere clearly known as a wild plant. But Alph. De Candolle, in his former work, had discarded this view, on the ground that it had no Sanskrit name, and that there was no evidence of its early cultivation in India or further East.

Adhering, however, to the idea that our plant was the *Dolichos* and the *Phaseolus* or *Phaselos* of the Greeks, and of the Romans in the time of the Empire, he conjectured that its probable home was in some part of Northwestern Asia. But recently, as "no one would have dreamed of looking for its origin in the New World," he was greatly surprised when its fruits and seeds were found to abound in the tombs of the old Peruvians at Ancon, accompanied by many other grains or vegetable products, every one of them exclusively



**THE EURYPHARYNX PELECANOIDES.**

to improve on them, the writer proceeds to describe the new processes of Otter Fischer for making rosaniline.

Triamidotriphenylmethan and its derivatives are first made by uniting the hydrochloric acid salt of paranitrobenzaldehyde with the aromatic amines, in the presence of chloride of zinc to form leuco bases. The process is as follows: 10 parts of the paranitrobenzaldehyde are dissolved in 50 parts of alcohol and 50 parts of hydrochloric acid added. To this solution he adds gradually 12 parts of pulverized zinc and warms gently until it is all dissolved. The alcohol is next distilled off, the mass evaporated on a water bath to dryness, and the whole mass heated with 17 parts of hydrochlorate of aniline and 10 of solid chloride of zinc to 250° or 280°. From this fused mass the paraleucaniline is isolated in the usual way, and then converted into rosaniline by any oxidizing agent, like black oxide of manganese or chloranil.

If orthotoluidine, or xylydine, is substituted for the aniline, the result will be a homologue of leucaniline. Instead of aniline the mono or dimethylaniline can be used and the leuco base of methyl violet obtained. With benzylmethyl or ethyl-aniline the bluish purple dyes are produced.

Another method of making rosaniline and its salts has been proposed by Fischer, which sets out with the nitro-leuco bases. He heats 15 parts of paranitrobenzaldehyde with 30 parts of sulphate of aniline and 20 or 30 parts of chloride of zinc until the nitro body has nearly disappeared. This gives a nitro-leuco base, which is converted into a dye by suitable oxidizing means like corrosive sublimate.

Dyes of the rosaniline group are made by the action of nitrobenzylchloride upon salts of primary aromatic amines in the presence of oxidizing agents. One equivalent of nitrobenzyl chloride is heated with two of the sulphate of aniline or toluidine, or a mixture of both, with the addition of one equivalent of perchloride of iron, to about 300° or 350° C. The fused mass has a bronze luster, and the dye can be extracted with water. By using the sulpho-acids of

American. In his present very careful article he admits that we cannot be sure that it was known in Europe before the discovery of America, and that directly afterward many varieties of it appeared all at once in the gardens, and the authors of the time began to speak of them; that most of the related species of the genus belong to South America, where, moreover, many sorts of beans were in cultivation before the coming of the Spaniards; and the idea that it might have been native to both hemispheres is discarded as altogether improbable. Upon this showing, it would appear that the plant should have been set down as of American, rather than of wholly unknown, origin. Indeed, when all the evidence is brought out, the discovery of these beans in the Ancon tombs need excite no more surprise than that of the maize which accompanied them.

For maize, beans, and pumpkins were cultivated together, immemorially, all the way from the Isthmus to Canada. And, although some of the sorts of beans mentioned by Oviedo in 1526, as raised in great abundance in Nicaragua, where they are native, and also of those everywhere met with by De Soto (1539-42) in his march from Tampa Bay in Florida to the Mississippi, doubtless belonged to *Phaseolus lunatus*, yet most if not all of those which at the same early period Jacques Cartier found cultivated by the Indians of Canada must have belonged to *Phaseolus vulgaris*, or its dwarf variety, *P. nanus*; for only these are well adapted to the climate of Canada, especially the low and precocious variety, which alone has time to mature between the spring and the autumn frosts. Indeed those same beans, derived from the Indians along with maize and pumpkins, have doubtless continued here in New England in direct descent, to form that staple diet for which the northern part of the coast of Massachusetts has long been famous; so that when Rufus Choate, defending a ship captain against a charge of

\* Bean in Great Britain is *Faba* (the fève of the French), and the varieties of *Phaseolus* are called French beans.

ill treatment in having fed his crew exclusively upon it, rehearsed, in his accustomed affluence of language, the praises of "that excellent esculent and superlatively succulent vegetable, the bean," he was celebrating the good qualities of a distinctively and aboriginally American article of food.

We are not to suppose, however, that this species had its home in North America, at least north of Mexico. The same may be said of our squashes and pumpkin, for which similar reclamation may be attempted upon another occasion.

#### Patent Law Amendment in England.

The annual discussion of patent law changes and the introduction of a new bill in Parliament is now going on once more in England. For several years past each proposed bill has for some reason or other failed to pass. Every year a new discussion and further study of the subject takes place among those who are interested in the subject; and every discussion seems to tend toward the formation of a public opinion in favor of a new patent law that shall have a practical similarity to that of the United States.

Some very interesting papers on the patent law amendment have been read before the Society of Arts, London, followed by spicy discussions thereof on the part of intelligent members. Sir Frederick Bramwell lately read a fresh paper on the subject before the Society, which is particularly noticeable owing to the fact that last fall he came over to this country for the special purpose of studying the working of our patent law system. His recent paper, from which we will give abstracts, may be regarded as a kind of report of things that came under his notice while in the United States.

He states that he put himself in communication here with many persons competent to advise on patent matters, among whom were patentees, manufacturers, lawyers in practice, and the Commissioner of Patents. Mr. Marble, who gave him various special facilities for information. He says:

"The first thing that strikes an Englishman, accustomed to consider these subjects in his own country, and to bear the views not infrequently expressed there respecting them, is the totally different feeling that prevails among the public generally in the United States, and (no doubt, as a consequence of this different feeling) the difference in the spirit with which patent matters are dealt with by the United States Government.

"This feeling is well shown by the following passage in the report of the United States Patent Commission, issued in 1870, when, the question having been raised as to whether certain reports were worth their cost, the Commissioner expressed his opinion thereon, and on the value of patents generally, in these words:

"In view of the great benefits which the patent system has already conferred upon the nation, single inventions—like the sewing machine, the harvester, the telegraph, or vulcanized rubber—having more enriched the country than the whole system has cost from its inauguration to the present time, I believe that the expense of retaining the mechanical report, in addition to the new publication, would be fully justified."

But in England, he says, "I commonly hear the jeering remarks that are made about most men who exercise themselves in invention, not about all men who do so, for it has been well said 'there is nothing succeeds like success,' and when a man has become known to the public as a successful inventor, he may further invent without reproach, although the very subsequent inventions of such a one would, had they emanated from a beginner, have given rise to the common sneer, 'Oh, so and so has become an inventor;' the fact is, if the man is your friend, and you are advocating, say, his fitness for election into some club or society, you have to confess that he was weak enough to invent, but that it was done in a thoughtless moment, and to express your belief that hereafter he will refrain from any such reprehensible conduct, and, if admitted into the club or society, will henceforth behave himself with the utmost decorum.

"This grudging acknowledgment of patents and patentees is shared in by the government. I don't mean the government of the present day, or that of any other political party, but I mean those in power for the time being. Instead of looking upon inventors and inventions as being the source from which improvement, and thereupon, prosperity, comfort, health, and the maintenance of the revenue of the country, depend, they regard them with jealousy, and doubt whether the patent laws, that give property in invention, ought not to be abolished; but feel sure that while they are continued, their only, or at all events, their greatest utility is that of adding by a voluntary taxation to the income of the country. Thus it is that the government, while taking over £200,000 a year from patentees, grudge the expenditure necessary for proper buildings, efficient staff, efficient control, creditable publications of the patents and their drawings, and room to store them.

"How different from all this is the state of things in America, and is so whether one looks at public opinion and feeling or at the conduct of the government, the reflex of that opinion and feeling. If you talk with men of position and influence in America, you find they speak with pride of the inventive fecundity of their countrymen; if they wish to interest you in a man whom you are about to meet, they will commonly do so by relating his inventions. In America, it is well understood that to their inventors they owe their success in manufacture, and the inventor is, there-

fore, with them looked upon as a benefactor, and as one to be encouraged and not to be sneered at as he too often is here. All unconsciously many an Englishman recognizes the development of American industries due to inventions, for it is a common thing to hear said, when something peculiarly novel and ingenious is being discussed, 'I suppose this comes from America.'

"Next, as regards the action of the government. How do they treat inventors? And, first, what accommodation do they afford for the patent business? Upon this point, although it is a thrice told tale in these rooms, I must refer to that which strikes the eye of any one visiting Washington. Among the many fine buildings of that city, the one that takes the second, or the third place, is the patent office. The Capitol comes undoubtedly first; whether the treasury or the patent office comes next, I am not quite clear, but I am clear that the patent office is a building measuring about 450 feet by 300 feet, of handsome elevation, and of excellent material (white marble), and surrounded by fine streets on all four sides. In this building, there are a staff of 491 persons engaged on the patent business, which staff is about to be increased, the whole superintended by a Commissioner of Patents. Notwithstanding the small fees paid by patentees, the receipts, in 1881, were \$553,000, or £170,600; and I was told that the receipts for the current year would be \$1,000,000, or £200,000, while the expenses of 1881 were £116,000. With the object of diffusing information regarding patents throughout the vast territory of the United States, as many as 20,000 copies of the patent law, and of the rules, are sent, per annum, gratuitously to different parts, while, as a proof of the interest taken by the public in the subject, I was informed that the average daily sale of specifications has amounted to 2,000 copies."

In the discussion, Captain Galton, the chairman, said: Among the most important of the questions which it raised, was whether we should in England follow the old practice of regarding the inventor as the enemy of the public, or adopt the American view, that he was a benefactor to the community. The Society of Arts Bill had been drawn on the latter view, and he was very glad to find that it was to be again introduced in the ensuing session of Parliament.

Mr. W. E. Newton said he expected to have heard more about the practice in the American patent office, especially with regard to examinations for novelty; and should be quite willing to have all applications examined as to novelty, in order that the supposed inventor might be informed if he were not really the true and first inventor; but the new bill did not touch that subject.

Mr. Imray said: If it were possible, by any system of examination, either as to subject matter, novelty, or utility, to give a patentee an indefeasible right, examine by all means, but so long as the right remained just as questionable after, as it was before, what was the good of examination? The patentee got no benefit, nor the public either. Patent agents who had to take out patents in America knew what difficulties they had to contend with there, the most frivolous objections being sometimes raised by the examiners. To give an example: a client of his invented a method of turning the slag for blast furnaces, by the addition of certain chemicals, into very excellent glass for bottles; he applied for a patent in America, and the objection raised was that in some book, thirty years old, there was this sentence: "The slag of blast furnaces is of a vitreous nature."

Mr. Tweddell said he had had a good deal to do with patents, and might say a few words from the patentees' and users' point of view. He was glad to find that Sir Frederick Bramwell had found so little to say in favor of the American system as being superior to our own. On the whole, he thought Sir Frederick's bill stood out much better after Sir Frederick's visit to America than it did before. No less than 13 per cent of the patents taken out in England in 1882 were by the Americans, 9 per cent by Frenchmen, and 8 per cent by Germans, which showed that even the law of 1852 was not unfavorable to inventors. With regard to the improvement in the national resources by lowering the scale of fees, they had heard that if a few dollars had to be paid at the end of six years, 25 per cent of the American patents would be swept away, which did not say much for the value of American patents as a whole; perhaps the same would apply to this country.

Mr. James Wilson, like the previous speakers, had expected that the American system would have given more information how to reform our patent laws than appeared to be the case. The main points seemed to be that the American system was so much cheaper, that the patent lasted three years longer, and that there were examiners. The history of patents disclosed several facts unfavorable to the system of examinations. He believed that in Germany both Bessemer's and Siemens' processes were refused a patent, and if this was done under an enlightened government like the Prussian, he did not see how examination would prevent wrong being done. If examiners were appointed at all, he thought it would be necessary to have a large number, representing every branch of science, for it often happened that specialists were wonderfully ignorant of matters only just outside their own immediate subject.

Mr. Alfred Carpmael said Sir Frederick Bramwell had referred to several reports of the American Patent Office, but he might be pardoned for reading a few lines from one he had not mentioned, bearing on the position of inventors: "No right can be more unquestionable than that resulting from discovery, unless it be that which is derived from actual creation. The recognition of either, if not instinctive in the

brute, is certainly found in the lowest and most uncultivated orders of human intelligence. The bird seems to have a sense of the property in its nest; the beast in its lair; the savage certainly in the cave he has discovered, or the weapon he has made. Even the first occupant of a tract of land, which he has neither discovered nor created, has a title which, in the absence of a better, is protected by the governments of all civilized countries. To none of these is the title of the inventor at all inferior. He has created or discovered all that he claims the right to possess. The property for which he asks protection might never have existed but for him who has created it out of nothing. At least, he has called it into active being, and made it the servant of mankind, subject to the limited right of ownership which he claims for himself. And when it is remembered that it is chiefly through the exercise of the inventive faculty that civilized man has risen above the savage, or that even the savage is to be distinguished from the brute, that it is the inventor who has either directly or indirectly been, and still is, the great instrument of human progress, that his has been the wizard wand which has called forth from the latent powers of nature messengers and servants, surpassing in fleetness, power, and mute obedience, the fabulous geni of Eastern tale, which has seized and freed as by enchantment the transient and varying lineament, or the flying sound, and transmitted them unchanged to posterity; or that in humbler but perhaps equally useful endeavor, he wears out his life in often unrequited efforts to benefit mankind, it must be a mistaken or perverted impulse which would grudge him that protection which is accorded to all others, or that would fail to encourage in all suitable ways, efforts from which the world is now reaping such incalculable benefits. . . . The reason why hundreds of intellects in all parts of our country are strained to their utmost tension in the attempt to discover something that shall prove useful to mankind, is attributable to the fact that individual profit is incomparably blended with the general welfare. But who would cultivate a field if others were to have an equal right to reap the harvest? The acknowledgment and protection of private property are the parents of industry, and effect as much in relation to inventions as to any other species of possession or estate.

The last speaker said that political economists opposed patents, but he had found that one of the greatest of them, Mr. J. S. Mill, had recorded his opinion that the proper way to reward inventors was by granting patents, not to give them a public grant, because then those who used the invention would pay for it, and he further considered that an invention ought to be protected, and the inventor rewarded. He wished to point out the especial hardship of the present law with regard to foreigners, of which there had recently been an important exemplification. Nobody doubted who was the inventor of the phonograph, and under any proper law Mr. Edison would not have had to abandon that child of his; but because it had been held that he did not sufficiently indicate the nature of his invention in his provisional specification, he had had to disown that latest child of his genius. Sir Frederick Bramwell had expatiated on the position of an orphan invention found in the gutter; but what was the position of the phonograph? Discarded by its inventive father, declared illegitimate by the laws of the country, incapable by law of having any relations of any sort or kind, how long that poor invention would live but for the fact that its twin brother in America was still protected, he did not know; but he feared that if it were not that Mr. Edison was still left to protect it in America, we should have heard no more of it. Yet he saw no reason to doubt that, in the immediate future, that which was now a mere toy would prove as useful to the community as its cousin, the telephone. To give another instance:

A gentleman named Wegmann made an invention, which had revolutionized the whole milling system of the civilized world. After many years' experiments he devised a system whereby he mounted cylinders of porcelain on rollers, and turned them up true; and by their means he produced the results of milling on semolina, middlings, and other products of grain, without any of the mischief which arose from the grinding operation of the millstones. The value of the invention was admitted, in a recent trial, to be upwards of £400,000 a year to this country, a large proportion of which was derived from what was previously a waste product, going away with the bran into the washtub. But because this gentleman was a foreigner, and there was no one to tell him, in the first instance, that he was not sufficiently clear, and no means of amending afterward, the patent was lost to him in this country. The translation made was, "I coat rollers with china;" and the court held that coating meant something in the nature of painting or enameling, and as there was not sufficient information in his original patent, no amount of disclaimer could put any more in. He never thought of this case without a feeling of shame that our law was in that condition. He thought, therefore, they would all agree with the concluding part of an article in the leading journal of the previous Wednesday, that "it would be expedient in the new law that more tenderness should be shown toward the rights of inventors in the experimental stages of their labors."

A CORRESPONDENT of the *British Medical Journal* (Jan. 13, p. 90) states that he has found the application of a strong solution of chromic acid, three or four times, by means of a camel's hair pencil, to be the most efficient and easy method of removing warts. They become black and soon fall off.